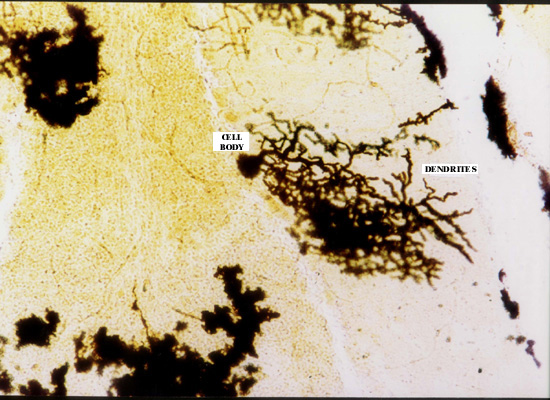
**NERVOUS TISSUE**

**LABORATORY DEMONSTRATIONS**

# PURKINJE CELL

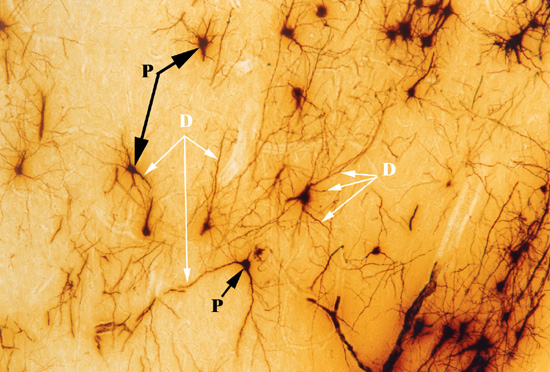
## 200X

This cerebellar cell has been stained with a Golgi (silver) stain to show it's elaborate dendritic tree. Note the complex branching evident in the dendrites. The axon of this cell is not visible in this section.



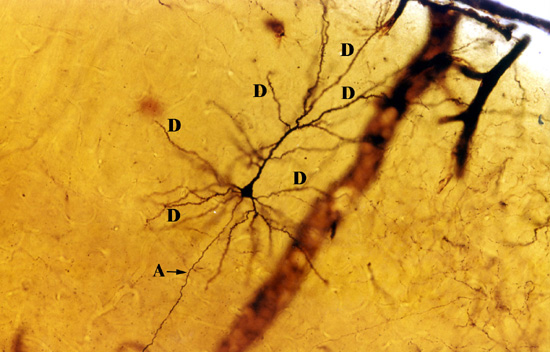
# MULTIPOLAR NEURONS

Golgi (silver) stained cross sections through the cerebrum showing large multipolar pyramidal cells (P) and their dendrites (D). The axons of these cells, while stained, are not readily distinguishable from the dendrites and disappear from the plane of the section.



# MULTIPOLAR NEURON

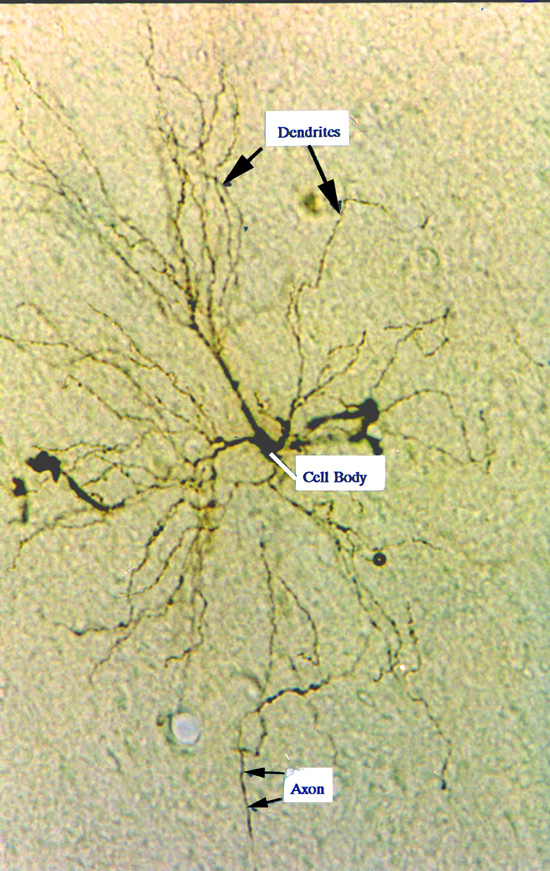
Multipolar neuron in the cerebral cortex stained with a Golgi stain. Note the multiple dendrites (D) emerging from the soma. The beaded appearance of the dendrites is due to the numerous dendritic spines, which are the sites of synaptic contact with other neighboring neurons which are not stained. The axon (A) can be seen emerging from the ventral portion of the soma. It can be distinguished from the dendrites by the absence of spines.



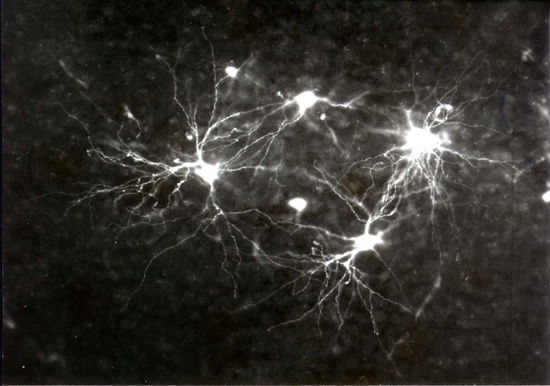
# THALAMIC CELL

The neuron on the left (200X) has been stained via intracellular injection of a dye to reveal the morphology of the entire cell.

Note the extensive radially orinted dendritic tree and the long axon leaving the field of view. These cells are typical of multipolar neurons.

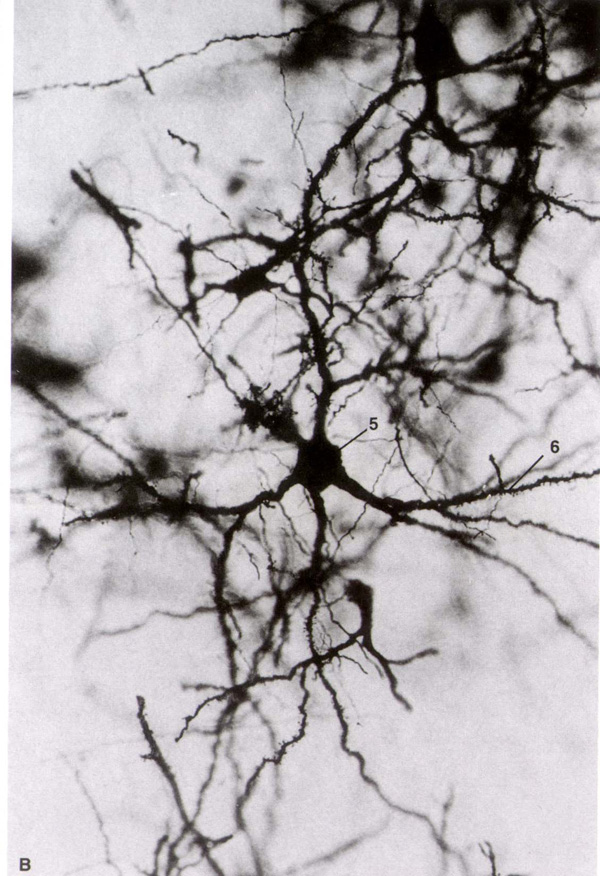


The neurons on the right (100X) have been similarly stained intracellularly with a fluorescent dye.



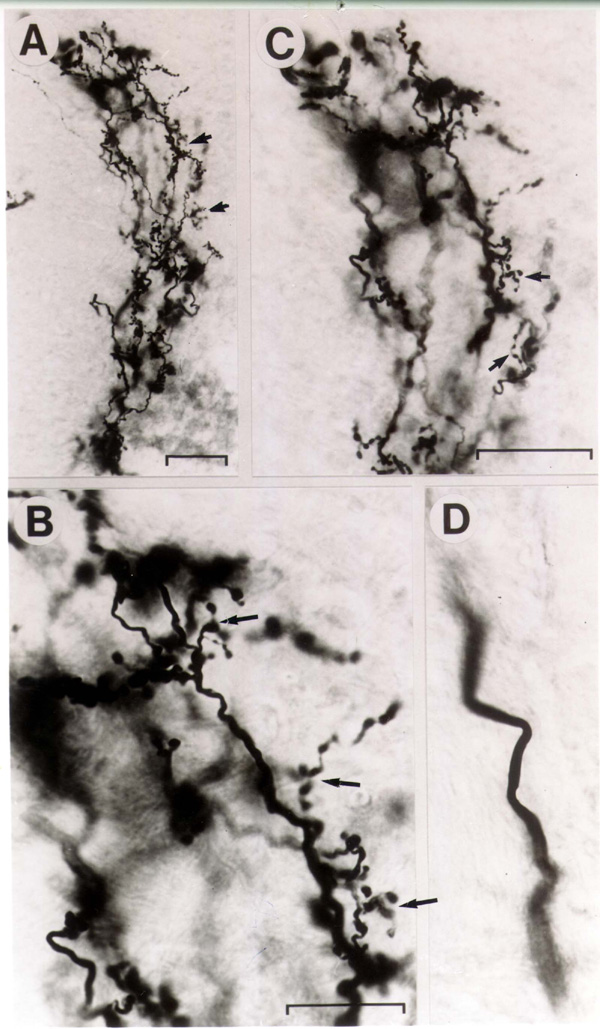
# GOLGI STAINED NEURONS

Light micrographs of (A) the cerebral cortex and (B) striatum showing neurons after Golgi-Kopsch silver impregnation.   
  
1. Cell soma of pyramidal cell   
2. Apical dendrite   
3. Basal dendrite   
4. Initial portion of axon   
5. Cell soma of neuron in the striatum   
6. Dendrite with spines



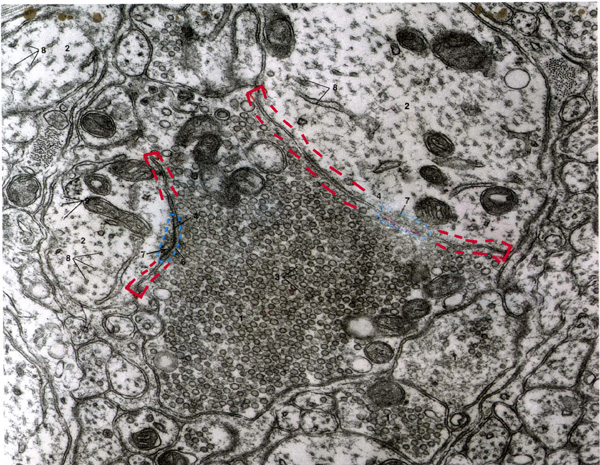
# LIGHT MICROGRAPHS OF AXON TERMINALS

Low power (A & B) and high power (C & D) micrographs of two axon terminals from second order neurons in the brainstem terminating in the neuropil of the thalamus. These axon terminals have been filled with an intracellular dye to reveal their fine detail. Arrows indicate the numerous swellings of the terminal boutons, which are the sites of synaptic contacts of these axons with their postsynaptic targets.



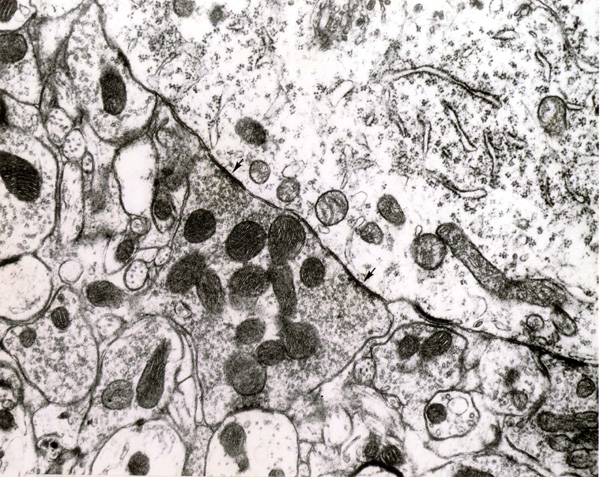
# AXO-DENDRITIC SYNAPSE - EM

1. Axon   
2. Dendrite   
3. Synaptic vesicles   
4. Axo-dendritic synapse   
5. Presynaptic membrane   
6. Synaptic cleft   
7. Postsynaptic membrane   
8. Neurotubules   
9. Neurofilaments   
Red Brackets = Synapse   
Blue brackets = Active zone



# AXOSOMATIC & AXODENDRITIC SYNAPSES - EM

From Fawcett's The Cell. Axosomatic and axodendritic synapses in the central nervous system of the rat. Axosomatic synapses: the nerve terminal in the center of the figure synapses with the cell body of a neuron at the upper right. The nerve ending is filled with mitochondria and synaptic vesicles. Two synaptic complexes (active sites) on the interface with the cell body are indicated by arrows. At the left, the same axon synapses with a dendrite. Another axodendritic synapse is seen at the top of the figure.



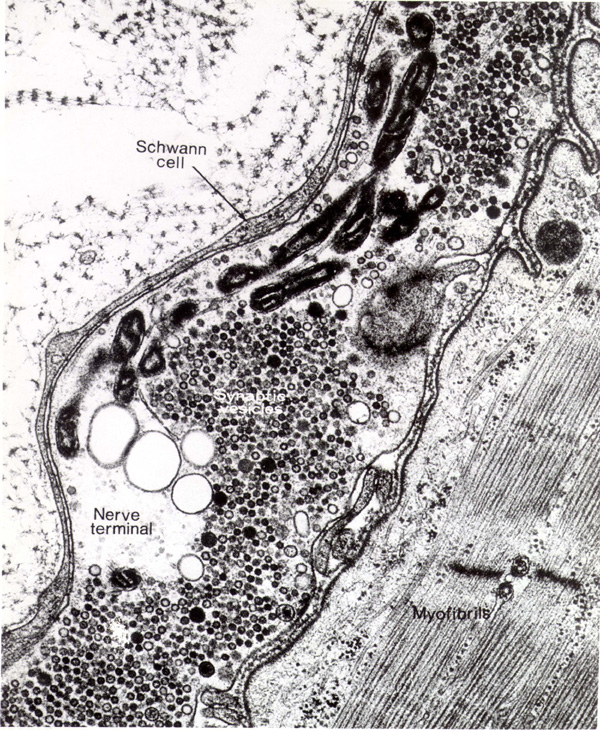
# AXODENDRITIC SYNAPSE - EM

From Fawcett's The Cell. Axodendritic synapse from rat central nervous system. A nerve enters the field at the upper right. Its myelin sheath terminates and its axon expands into a terminal bouton closely applied to the surface of a large dendrite at the left. The nerve terminal is filled with synaptic vesicles. The active zone (arrow) is of relatively limited extent.



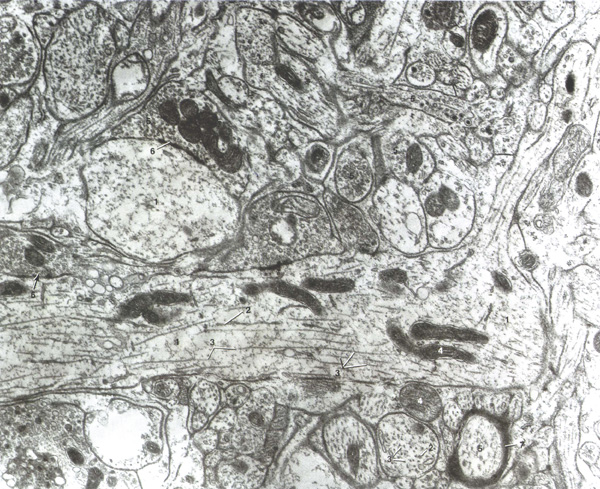
# MYONEURAL JUNCTION - EM

From Fawcett's The Cell. Longitudinal section of frog myoneural junction prepared by freeze substitution. There are a profusion of small spherical synaptic vesicles in the nerve terminal. In such unstimulated nerve terminals, synaptic vesicles are rarely seen discharging their content of transmitter into the synaptic cleft.



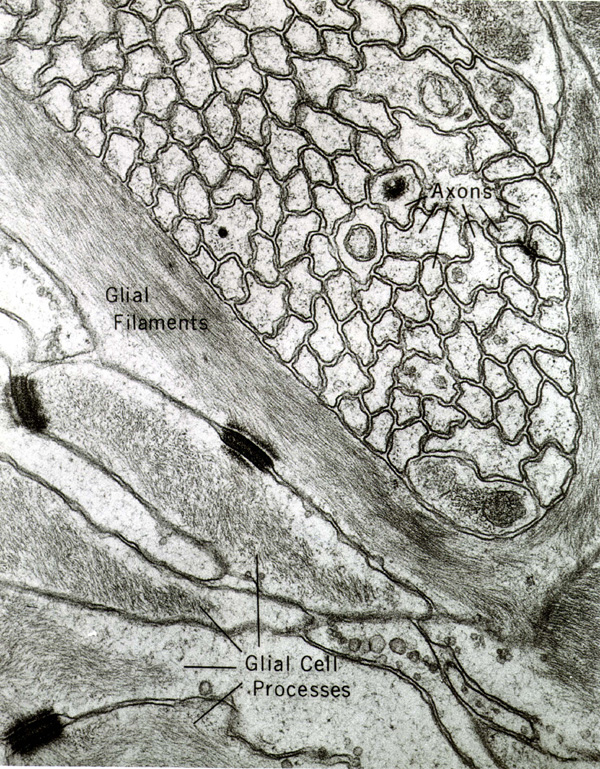
# NEUROPIL - EM

Neuropil in the brain stem   
  
1. Dendrite   
2. Neurotubule   
3. Neurofilament   
4. Mitochondrium   
5. Axon   
6. Axo-dendritic synapse   
7. Myelin



# NEUROGLIAL CELL PROCESSES EM

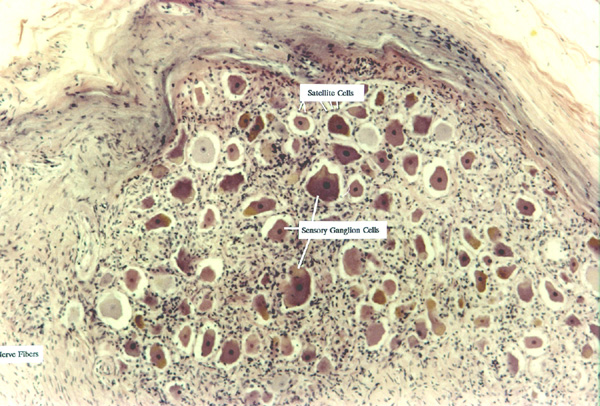
From Fawcett's The Cell. Axial nerve cord of the annelid Aphrodite aculeata. The processes of neuroglial cells in the nervous system of both invertebrates and vertebrates are crowded with filaments that closely resemble the tonofilaments of epithelial cells. They are generally oriented parallel to the long axis of the cell process, and some of them, like tonofilaments of the epithelia, terminate in desmosomes.



# DORSAL ROOT GANGLION

# 200X

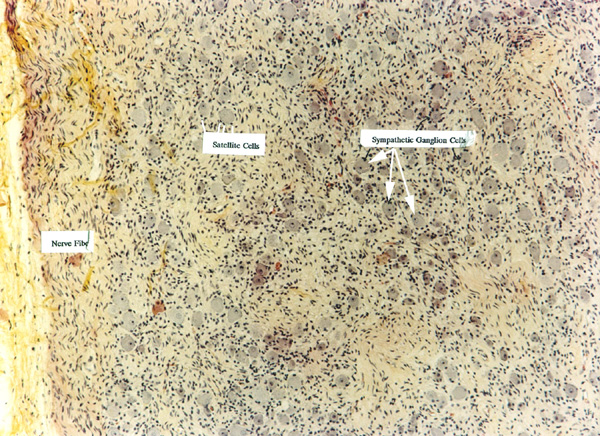
Cross section through a spinal ganglion showing large pseudo-unipolar ganglion cells encapsulated by smaller satellite cells. Note that the cells appear arranged in cords or clumps separated by fibers and nuclei of these cells tend to be centrally located.



# SYMPATHETIC GANGLION

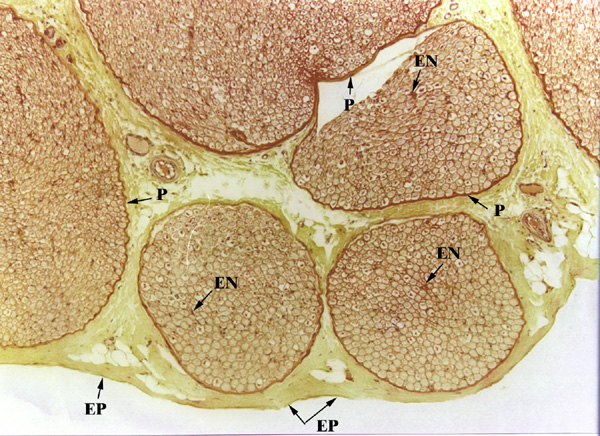
# 400X

Cross section through a sympathetic ganglion. Note that the cells appear somewhat randomly arrayed throughout the tissue and their nuclei are eccentrically located. Though (like sensory ganglion cells) they are surrounded by satellite cells, their satellite cell capsule is less complete. Note also numerous bundles of nerve fibers running through the ganglion.



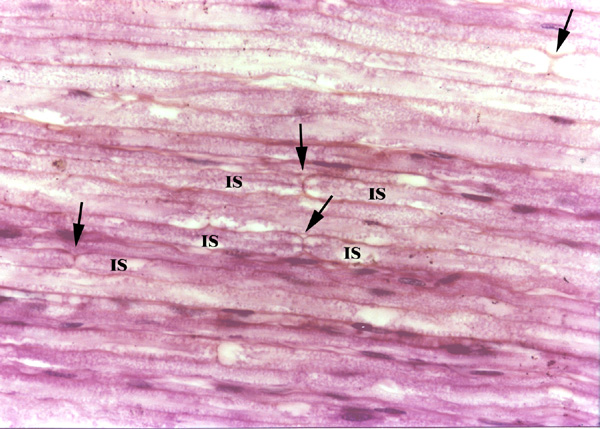
# NERVE CONNECTIVE TISSUE

Cross section through a peripheral nerve showing the connective tissue coverings of the nerve fibers. EN = endoneurium, P= perineurium, EP = epineurium.



# NODE OF RANVIER

Longitudinal section through a medullated nerve showing the nodes of Ranvier (arrows) and the internodal segments on either side which represents the contributions of a single Schwann cell to the myelin sheath of the enclosed axon. NR = node of Ranvier, IS = internodal segment.



# EM OF PERIPHERAL NERVE

Mixed nerve from cat pericardium. Illustrated here at higher magnification are myelinated (M) and unmyelinated (U) peripheral nerves, each invested by a continous lamina externa. The outer limit of this layer is clearly visible in the discontinuity in density at the arrows.

